

C3 *intracellularis* said method comprising the step of: administering to said animal an immunologically effective amount of a polypeptide that comprises the amino acid sequence of SEQ ID NO:2 for a time and under conditions sufficient to induce a protective immune response against *L. intracellularis* or related microorganism.

C4 43. (Twice Amended) The method of claim 41 wherein the polypeptide is encoded by nucleic acid comprising SEQ ID NO: 1.

Please add the following Claims:

Sub D20 94. (New) A vaccine composition for administration to an animal comprising an immunologically effective amount of a polypeptide that is immunologically cross reactive with a polypeptide comprising the sequence of SEQ ID NO: 2 and comprises an amino acid sequence encoded by nucleic acid that hybridizes to the complement of a nucleotide comprising the sequence of SEQ ID NO: 1 under hybridization conditions comprising at least about 16% (v/v) formamide to at least about 30% (v/v) formamide and at least about 0.5M salt to at least about 0.9M salt.

C5 95. (New) A method of vaccinating an animal against infection by *L. intracellularis* or related microorganism or treating an animal infected by *L. intracellularis* said method comprising the step of: administering to said animal an immunologically effective amount of a polypeptide that is immunologically cross reactive with a polypeptide comprising the sequence of a polypeptide comprising the sequence of SEQ ID NO:2 and comprises an amino acid sequence encoded by nucleic acid that hybridizes to the complement of SEQ ID NO: 1 under hybridization conditions comprising at least about 16% (v/v) formamide to at least about 30% (v/v) formamide and at least about 0.5M salt to at least about 0.9M salt.

96. (New) An isolated nucleic acid molecule comprising a sequence encoding the amino acid sequence of SEQ ID NO:2.

97. (New) The isolated nucleic acid molecule of claim 96, comprising the nucleotide sequence of SEQ ID NO: 1.

98. (New) An isolated nucleic acid molecule comprising a sequence that hybridizes to the complement of SEQ ID NO: 1 under hybridization conditions comprising at least about 16% (v/v) formamide to at least about 30% (v/v) formamide and at least about 0.5M salt

to at least about 0.9M salt, said nucleic acid molecule encoding a polypeptide that is immunologically cross reactive with SEQ ID NO:2.

99. (New) An isolated nucleic acid molecule comprising a sequence that hybridizes to the complement of SEQ ID NO: 1 under hybridization conditions comprising at least about 31% (v/v) formamide to at least about 50% (v/v) formamide and at least about 0.01M salt to at least about 0.15M salt, said nucleic acid molecule encoding a polypeptide that is immunologically cross reactive with a polypeptide comprising the sequence of SEQ ID NO:2.
100. (New) The isolated nucleic acid molecule of claim 98 wherein said polypeptide is capable of eliciting the production of antibodies against a polypeptide comprising the sequence of SEQ ID NO:2.
101. (New) The isolated nucleic acid molecule of claim 99 wherein said polypeptide is capable of eliciting the production of antibodies against a polypeptide comprising the sequence of SEQ ID NO:2.
102. (New) The isolated nucleic acid molecule of claim 96 fused to nucleic acid encoding a fusion partner.
103. (New) A genetic construct comprising a nucleic acid molecule comprising a nucleotide sequence encoding the amino acid sequence of a polypeptide comprising the sequence of SEQ ID NO:2 operably linked to a promoter sequence.
104. (New) A host cell comprising the genetic construct of claim 103.
105. (New) An isolated polypeptide comprising the amino acid sequence of a polypeptide comprising the sequence of SEQ ID NO:2.
106. A method of producing a polypeptide comprising the amino acid sequence of SEQ ID NO:2 in a host cell comprising expressing in said cell a heterologous nucleic acid molecule comprising a nucleotide sequence encoding the amino acid sequence of SEQ ID NO:2 under conditions sufficient for protein synthesis to occur.
107. The method of claim 106, wherein the nucleic acid molecule comprises the nucleotide sequence of SEQ ID NO: 1.

108. ~~The vaccine composition of claim 10 wherein the animal is a pig~~

109. ~~The method of claim 12, wherein the animal is a pig~~

110. A method of detecting infection of an animal with *Lawsonia intracellularis* comprising conducting DNA amplification to detect the nucleotide sequence of SEQ ID NO: 1 or a part thereof in a biological sample from the animal wherein the presence of the nucleotide sequence of SEQ ID NO: 1 or said part indicates that the animal is infected.
111. The method of claim 110 wherein said DNA amplification is conducted using nucleic acid that hybridizes to a polynucleotide having the sequence of SEQ ID NO: 1 and nucleic acid that hybridizes to the complement of the polynucleotide having the sequence of SEQ ID NO: 1 under conditions equivalent to a hybridization in at least about 16% (v/v) formamide to at least about 30% (v/v) formamide and at least about 0.5M salt to at least about 0.9M salt.
112. A method of detecting past or current infection of an animal with *Lawsonia intracellularis* comprising screening a biological sample from the animal for antibodies that specifically bind to a polypeptide comprising the amino acid sequence of SEQ ID NO:2 wherein the presence of said antibodies indicates a past or current infection.
113. An isolated antibody that specifically binds to a polypeptide comprising the amino acid sequence of a polypeptide comprising the sequence of SEQ ID NO:2.

REMARKS

Election of Invention

In response to the Restriction Requirement of December 18, 2000, in which the Examiner states that Claims 1-93 define 49 different inventions, Applicants elect, the Group 2 claims directed to a polypeptide comprising the sequence of SEQ ID NO:2, vaccines comprising the polypeptide having a sequence of SEQ ID NO:2 (i.e. GroEL) and methods therefor, for further consideration in the instant application.

Election of Species

In response to the election of species requirement with regard to Claim 6, Applicants elect the species including (A) polypeptide. With regard to the election of species requirement in connection with Claim 37, Applicants elect the species including (A) peptide, protein or polypeptide. Finally, in regard to the election of species requirement relating to Claims 9 and 40, Applicants elect the species including (B) heatshock protein and flagellar basal body rod protein.